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MODEL NSD8

OPERATION AND SERVICE MANUAL

P/N 6007052, REVISION B
OCTOBER 2013

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Part number 6007052/ Revision B

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How to Use This Manual

The Operation and Service Manual describes how to operate, configure, calibrate, maintain and troubleshoot the Model NSD8 Room Controller. The manual is divided into two parts. Part one describes the unit and how to interface with the device. This section should be read by users, facilities staff, and anyone who requires a basic understanding of how the device operates.

Part two describes the technical aspects of the product which include operation, configuration, calibration, maintenance and troubleshooting. Part two should be read by personnel programming or maintaining the unit. **TSI recommends thoroughly reading this manual before changing any software items.**

NOTE: This operation and service manual assumes that the controller has been properly installed. Refer to the Installation Instructions if there is any question as to whether the controller has been installed properly.

Safety Information

This section gives instructions to promote safe and proper handling of Model NSD8 Nurses Station Monitor.

There are no user-serviceable parts inside the instrument. **Opening the instrument case will void the warranty.** Refer all service of the unit to a qualified technician.

Description of Caution Symbol

C a u t i o n
Caution indicates: • Equipment may be damaged if procedures are not followed. • Improper settings may result in loss of containment. • Important information about unit operation.

Access Code

Model NSD8 Room Monitor has access codes to limit unauthorized access to the room mode or complete menu system. The access codes can be turned on or off through the **Passcode** menu item. When the units ship from TSI, they are configured with the access code on. Refer to Appendix C, Access Codes, for instructions on entering the access code.

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Part One

User Basics

This section is designed to provide a brief but thorough overview of the product installed. These few pages explain the purpose (The Instrument) and the operation (Useful user information, Operator panel, Alarms) of the product. Technical product information is available in Part Two of the manual.

The Instrument

The Model NSD8 Room Controller is able to measure and report room pressure differential in health-care facilities and other critical environments.

Useful User Information

The monitor has colored icons for each connected room. The icon is green when the room pressure differential and other configured measurements are adequate. The icon turns red to indicate alarm status when the room pressure differential or another configured measurement has risen above or dropped below a safe level. The icon turns gray when the room is in no isolation mode.

Operator Panel

The Model NSD8 Nurses Station Monitors are easy to use. Normal vs. Alarm room status is always shown on the display for up to eight (8) connected rooms.

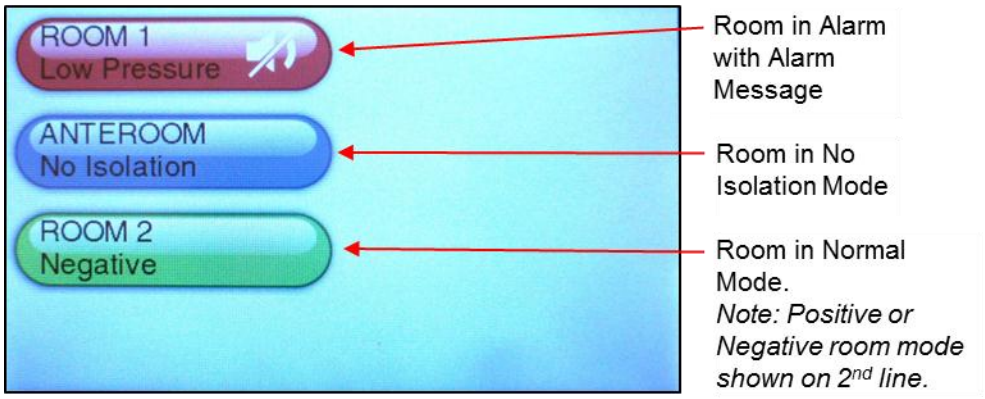

Figure 1. Room Indicators

Room Indicator Colors

Green	The screen icon is colored green (**NORMAL**) when the room pressure and/or other configured measurements are adequate for the indicated room. This light indicates the room is operating safely. If a set point cannot be maintained or an alarm limit has been reached, the green light turns off and the red alarm light turns on.
Red	The room icon is colored red (**ALARM**) when the room pressure and/or other configured measurements are not within alarm limits for the indicated room. This light indicates the room is not operating safely. The display screen will also indicate the type of alarm or an emergency message and the mute or alarm acknowledge icon.
Gray	The room icon is colored gray to indicate No Isolation mode for the indicated room. In No Isolation mode the Model RPM10 monitor, Model RPM20 monitor or Model RPC30 controller will not alarm.

Operator Keys

The following key appears on the display of the Model NSD8 Nurses Station Display:

MUTE key

The **MUTE** key silences an audible alarm on the Model NSD8 and on the connected PresSura monitor or controller. The alarm remains silent until the **MUTE TIME** value has been reached or the unit returns to control set point.

Alarms

The Model NSD8 display functions as a remote indicator. Alarms are indicated based on the status of connected monitors and controllers.

Visual Alarm

The room icon on the display of the monitor turns red to indicate an alarm condition. The icon turns continuously red for all alarm conditions.

Audible Alarms

The audible alarm is continuously on in all low and high alarm conditions. The audible alarm can be silenced by pressing the key.

Before Calling TSI

This manual should answer most questions and resolve most problems you may encounter. If you need assistance or further explanation, contact your local TSI representative or TSI. TSI is committed to providing high quality products backed by outstanding service.

Please have the following information available prior to contacting your authorized TSI Manufacturer's Representative or TSI:

- Model number of unit* NSD8
- Model numbers of connected PresSura monitors and controllers
- Software revision level*
- Facility where unit is installed

* Can be determined by entering the menu system.

For the name of your local TSI representative or to talk to TSI service personnel, please call TSI at (800) 874-2811 (U.S. and Canada) or (001 651) 490-2811 (other countries).

Prior to shipping any components to TSI for service or repair, please utilize our convenient Return Material Authorization (RMA) Form, which is available online at https://secure.tsi.com/rma/intro.aspx.

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Part Two

Technical Section

The PresSura™ Room Controller is ready to use after being properly installed and configured. The TSI through-the-wall sensor is factory calibrated, as are most pressure transducers. Figure 2 shows the Digital Interface Module (DIM) which is programmed with a default configuration that can be easily modified to fit your application.

Figure 2. PresSura Room Pressure Monitor Digital Interface Module

The technical section is separated into four parts that cover all aspects of the unit. Each section is written as independently as possible to minimize flipping back and forth through the manual for an answer.

The Software Programming section explains the programming keys on the DIM. In addition, the programming sequence is described, which is the same regardless of the menu item being changed. At the end of this section is an example of how to program the DIM.

The Menu and Menu Items section lists all of the software items available to program and change. The items are grouped by menu which means all set points are in one menu, control signal items in another, etc. The menu items and all related information is provided including; programming name, description of menu item, range of programmable values, and how the unit shipped from the factory (default value).

The Maintenance and Repair Parts section covers all routine maintenance of equipment, along with a list of repair parts.

The Troubleshooting section is split into two areas: mechanical operation of the unit and system performance. Many external variables will affect how the unit functions so it is critical to first determine if the system is having mechanical problems—i.e., no display on unit, alarms do not function, etc. If no mechanical problems exist, look for performance problems (i.e., does not seem to read correctly, display fluctuates, etc.). The first step is to determine that the system is mechanically operating correctly, followed by modifying the configuration to eliminate the performance problems.

Software Programming

Programming the PresSura Model NSD8 display is quick and easy if the proper keystroke procedure is followed. The programming keys are defined first, followed by the required keystroke procedure. At the end of this section is a programming example.

NOTE: It is important to note that the unit is always operating when programming. When a menu item value is changed, the new value takes effect ***immediately*** after saving the change, not when the unit returns to normal operating mode.

This section covers programming the instrument through the keypad and display.

Changing Room Mode

1. Press the Room Mode button for the room on the touchscreen.

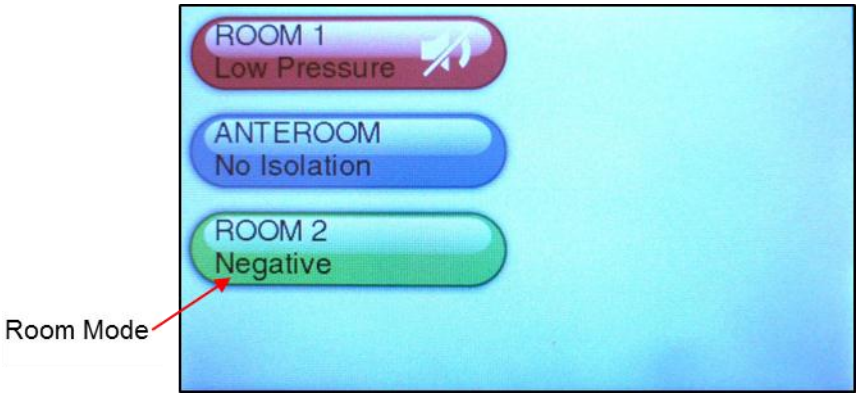

Figure 3. Main Running Screen

2. Select the desired room mode by pressing on the desired room mode button at the bottom of the screen.

NOTE: If a room mode is not selected, the PresSura monitor will return to the main running screen after a short delay,

Figure 4. Room Mode Selection Screen

Entering Menus

Swipe across the display, from the top right corner to the bottom left corner, to access the menu system.

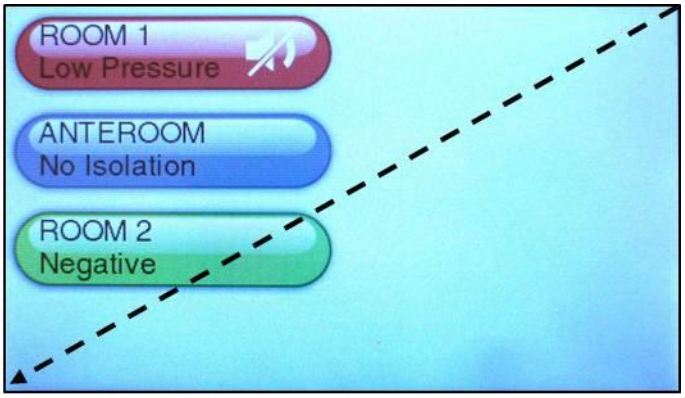

Figure 5. Swipe to Access Menu System

Menus and Menu Items

After accessing a menu, the screen will change to show the items associated with that menu. Refer to the Menu Items section for a list of the menus and their associated items.

Entering Data

After entering a menu item, the Model NSD8 monitor display will change items through a drop-down menu.

Figure 6. Menu System

Drop-Down Selection

It is easy to view available choices and make a selection from drop-down items. Touch the item displayed in the drop-down box to view all available options. Then, touch the item desired. Touch the **Save** button to save your selection and exit the item or touch the **Cancel** button to exit the item without saving.

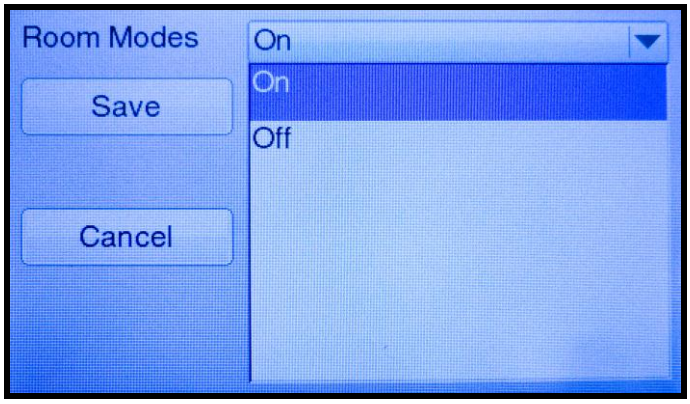

Figure 7. Using a Drop-Down Selection

Menu Items

The PresSura Model NSD8 monitor is a very versatile device which can be configured to meet your specific application. This section lists all of the menu items available to program and change (except diagnostics menu). Changing items is accomplished by using the touchscreen. If you are unfamiliar with the keystroke procedure, please see Software Programming section for a detailed explanation. This section provides the following information:

- Complete list of menus and all menu items.
- Gives the menu or programming name.
- Defines each menu item's function; what it does, how it does it, etc.
- Gives the range of values that can be programmed.
- Gives default item value (how it shipped from factory).

Figure 8 shows the PresSura Model NSD8 controller menu items.

Rescan
Room Modes
Passcode
Reset Settings
Touch Cal
Audible Alm

Figure 8. Menu Items – Model NSD8 Monitor

MENU ITEM	SOFTWARE NAME	ITEM DESCRIPTION	ITEM RANGE	DEFAULT VALUE
Rescan for connected PresSura monitors and controllers	Rescan	The **Rescan** item causes the NSD8 Nurses Station Monitor to scan its network to look for connected PresSura Model RPM10, RPM20, and RPC30 monitors and controllers.	N/A	N/A
Change Room Modes of connected PresSura monitors and controllers	Room Modes	The **Room Modes** item selects if the NSD8 Nurses Station Monitor can change the room mode of connected PresSura Model RPM10, RPM20, and RPC30 monitors and controllers. **NOTE:** The NSD8 Nurses Station Monitor cannot change a PresSura Model RPM10, RPM20, or RPC30 monitor/controller from negative to positive mode or vice versa.	On Off	On
Enable Access Codes	Passcode	The **Passcode** item selects whether an access code (pass code) is required to enter the menu items. The **Passcode** item prevents unauthorized access to a menu. If the **Passcode** item is: **OFF** no code is required to enter the room mode or menu screens. **ROOM MODE** access code is required to enter the room mode screens but not the menu screens **MENUS** access code is required to enter the menu screens but not the room mode screens **ALL** access code is required to enter the room mode and menu screens.	Off Room Mode Menus All	Menus
Reset Settings	Reset Settings	The **Reset Settings** item is used to change all settings to factory default. **Reset Settings** will not affect calibration.	N/A	N/A
Enable Sound	Audible Alm	The **Audible Alm** item enables the beeper on the PresSura display.	On, Off	Off

MENU ITEM	SOFTWARE NAME	ITEM DESCRIPTION	ITEM RANGE	DEFAULT VALUE
Recalibrate Touchscreen	Touch Cal	The **Touch Cal** item starts the touchscreen recalibration process. While recalibrating the touchscreen, the PresSura monitor will direct the user to touch the screen in various places. **NOTE:** Recalibrating the touchscreen is best accomplished using a stylus, pen, or similar object.	N/A	N/A

Maintenance and Repair Parts

The Model NSD8 Nurses Station Monitor does not require routine maintenance.

Replacement Parts

All components of the NSD8 monitor system are field replaceable. Contact TSI or your nearest TSI Manufacturer's Representative for replacement part pricing and delivery.

Part Number	Description
800985	Nurses Station Display

Troubleshooting Section

The Model NSD8 Nurses Station Display is designed to be trouble free. However, installation problems or interaction with other HVAC components may cause system problems. The system is easy to troubleshoot if an organized approach to evaluate the system is taken. Troubleshooting is broken down into hardware (mechanical) and software problems. Hardware problems deal with the physical installation of the device. Hardware problems include wiring problems, incorrectly installed equipment, and add-ons or non-TSI equipment. Software problems include control problems, configuration problems, or interaction problems with the HVAC system.

The hardware test described in this section determines that all TSI mechanical components are functioning correctly. The hardware test requires the diagnostics menu items to be accessed. If you are unfamiliar with the controller menus, see Software Programming for keystroke procedure. Troubleshooting the majority of problems is usually quick if the hardware test is followed.

Software and hardware problems are covered in the troubleshooting chart. Pick the problem that most closely resembles your problem and review the possible symptoms and corrective action. Software or system performance problems can and are affected by the supply air system, exhaust air system, or physical configuration of the room. Separating TSI system problems from the laboratory HVAC system can sometimes be difficult. TSI recommends confirming all hardware is operating correctly before troubleshooting software problems.

Hardware Test

Three tests need to be performed in order to determine all hardware is functioning correctly. The tests are broken down into:

- Confirming wiring is correct.
- Confirming physical installation is correct.
- Verifying mechanical components.

Confirming wiring is correct

The most common problem with installed hardware equipment is incorrect wiring. This problem usually exists on initial installation, or when modifications to the system take place. The wiring should be very closely checked to verify it *exactly* matches the wiring diagram. Wiring diagrams are located in Appendix B of this manual. Wiring associated with non-TSI components should be closely checked for correct installation. If non-TSI components are installed, consider disconnecting them for testing purposes.

Confirming physical installation is correct

All of the hardware components need to be installed properly. Review the installation instructions and verify components are installed properly at the correct location. This is easily done when the wiring is checked.

Verifying mechanical components

Verifying all TSI components are operating correctly requires following a simple procedure. The fastest procedure to confirm all equipment is operating is to first test the Digital Interface Module (DIM), and then go into the diagnostic menu to test each component.

Troubleshooting Chart

Symptom	Possible Cause	Corrective Action
Display is blank.	No power to DIM.	Verify circuit breaker is on. Verify transformer primary measures 110 VAC. Verify transformer secondary measures 24 to 30 VAC. Verify DIM voltage on pins 1 and 2 is 24 to 30 VAC (if powered from a transformer).
	DIM is defective.	If proper voltage is found between pins 1 and 2 of the DIM, all wiring has been checked, fuses have been reset, and screen is still blank, the DIM is probably defective. Replace DIM.
Cannot access menu		Slide finger across the screen diagonally from upper right to lower left corner.
Communications lost or monitor / controller not found	Monitor or controller added after Nurses Station Display powered up	Go to menu of Nurses Station Display and Rescan.
Undesired Room Order on Nurses Station Display		Update Nurse Address menu item on connected PresSura monitors and controllers.

Appendix A

Specifications*

Digital Interface Module	
Display	
# Rooms Displayed	Up to 8
Operating Temperature	32 to 120°F (0 to 50°C)
Input Power.....	24 VAC, 50/60 Hz 15 to 40 VDC 5 Watt maximum
Dimensions.....	7.0 in x 4.875 in x 1.75 in (17.8 cm x 12.4 cm x 4.4 cm) 0.625 in (1.6 cm) protrusion
Weight.....	14 oz (0.40 kg)

**Specifications are subject to change without notice.*

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Appendix B

Wiring Information

Back Panel Wiring

PIN #	Input / Output / Comm	Signal	Description
1, 2	Input	24 VAC/DC	Power in Digital Interface Module (DIM).
3-30	N/A	N/A	Not Used
31, 32, 33	Comm	RS-485	Nurse Station Display 31: B 32: A 33: Ref
34, 35, 36	N/A	N/A	Not Used

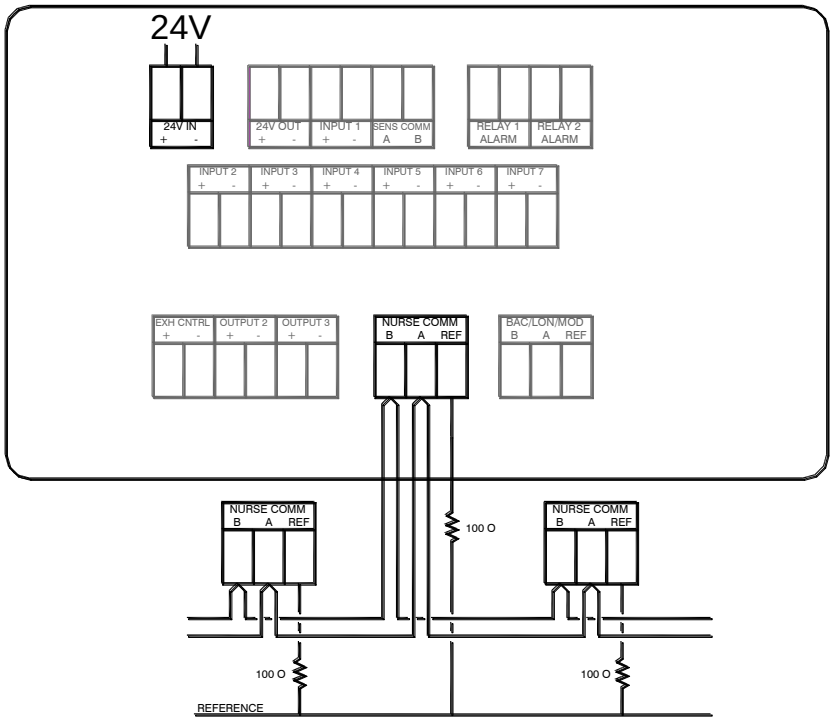

Figure 9: Wiring Diagram—Model NSD8 Nurses Station Display

Appendix C

Access Codes / Passcode

The Model NSD8 Nurses Station Display may prompt you to enter an access code to enter the menu system. The access code screen is shown below in Figure 10. To enter the access code, type in the 4-digit passcode shown below and press **Save**.

The PresSura displays feature two levels of passcode access:

- To change the **room mode**, use the passcode **0317**.
- To access the **menu** system, use the passcode **2887**.

Figure 10. Access Code Screen

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